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ABSTRACT

This paper demonstrates how jointly planned activities can provide an integrated system in bridging the quality gap between urban and rural education in Australia. A national communications policy and delivery system would provide a cost-effective way of improving services to rural areas. Rural schools and colleges can be transformed by developing partnerships between the school and the community. These programs can be implemented through open-access learning centers and community education centers which could meet a full range of relevant local employment, education and training needs in rural communities. This paper provides a case study analysis of recent experiences in Australian education, also drawing on recent experience in the Organization for Economic Cooperation and Development (OECD) countries and from Asian and Pacific Regional case studies. The main areas investigated in the case studies were: (1) collaboration between the national government and states; (2) collaboration across education sectors and between public and private providers; (3) giving the decision-making responsibility to the local level and broadening the base of school/college services to match local needs and priorities; (4) the setting of new national targets for post-compulsory education and training; (5) higher productivity through the use of technology; and (6) and evaluation of cost substitution measures. (LP)

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Education, Equity and the Crisis in the Rural Community: An Integrated Framework

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Abstract

The paper attempts to demonstrate how communications technology within a national framework, the development of local partnerships through community education centres, open access learning centres, and other such jointly planned activities, can provide an integrated system which can assist in bridging the 'quality gap' for rural areas.

Two key aspects of an integrated framework are examined in detail:

1. How the 'quality gap' in rural areas can be reduced through the development of a national communications policy and framework for the delivery of services to formal and non-formal programs of education and training in schools, technical and further education and higher education including those in rural areas.

   The examination of this area is wide ranging and includes the links between such a framework and the delivery of curricula, implementation of strategies and structures. It argues that a coordinated approach assisted by communications technology will enable a better and more cost effective way of improving services to rural areas. Special emphasis is given to the role that open access learning centres and community education centres can play in bridging the quality gap for rural areas.

2. How local rural schools and colleges can be transformed by developing partnerships between the school and the community.

   The paper argues that open access learning centres and community education centres can be a focus for the development and delivery of formal and non-formal educational programs designed to meet a fuller range of relevant local employment, education and training needs in local rural communities. These centres also provide access to the range of courses not normally available in rural areas through the links described in (1) above.

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This paper provides a case study analysis in considerable depth of recent experiences in Australian education, also drawing on recent experience in OECD countries and from Asian and Pacific Regional case studies. By highlighting the underlying forces at work which have led to rapid changes and by underlining successes and failures, it is hoped other educators will be in a position to draw relevant comparisons with their own situation.

Against this context some of the main thrusts being investigated at present are:

1. Collaboration between the national government and states (in a federal system) or between central and provincial governments.
2. Collaboration across education sectors (higher education, TAFE and schools) and between public and private providers
3. Harnessing local dynamism by devolving appropriate decision-making responsibility to the local level and broadening the base of school/college services to match local needs and priorities.
4. The setting of new national targets for post compulsory education and training which encompass schools, higher education, TAFE and other training and which identify target levels for attainment as well as participation.
5. Higher productivity through the use of technology where it allows:
   - flexible access by the learner;
   - access to larger audiences in areas of scarce teaching expertise;
   - access by rural learners who have no other options available.
6. Cost substitution, where communications technology can produce more 'time on task' or where substituting the costs of existing delivery mechanisms e.g. reducing travel budgets to provide funds for installing and maintaining 'distance education delivery'.

NOTE: The author has recently completed a report for the Australian Education Council (National and State Education Ministers) on ***Mobile Students: Improving Education in Remote Localities***. Recommendations from that report are now being implemented. The author is also the chairman of a National Working Party to develop an open access curriculum framework for national telecommunications delivery, covering three sectors of education: Higher Education, Technical and Further Education, and Schools.

1. Introduction

Australia is a nation undergoing profound and lasting changes to its employment, education and training infrastructure. In the 1990s Australians are at last beginning to focus on the need to be a 'clever country', to derive value added wealth from the extraction and export of raw

materials and so provide both the impetus and security for economic and social survival into the next century.

The changes taking place in Australia are such that is has been able to benefit quickly from developments elsewhere in the OECD countries and in Asia particularly where these developments address vocational education and training through attitudes which reflect a deep seated commitment to life-long education. Australia's transition from a simple provider of raw materials for near neighbours to an economic force with sustainable economic growth based upon the acquisition of skills, depends on its gaining a competitive edge in those things it can do well, particularly so in a world increasingly influenced by the economic and political pressures of the twin 'united states' - Europe and America. It has no choice but to make better use of its human and physical resources.

In Australia the question of reducing the quality gap between urban and rural areas has been broadened to include all those disadvantaged by 'distance':

- those whose personal situation makes it difficult for them to get institutional access (such as people who are ill or incapacitated or involved in the care of such people);
- those in areas where teaching expertise is scarce in normal schools and colleges;
- those beyond school age who wish to upgrade their qualifications but cannot unless education or training is delivered at home or in their workplace.

For this decade at least, it appears certain that major increases in resources for education are unlikely. To close the quality gap we have to be more productive within our existing resources.

2. *Overview of recent relevant changes in education and training in Australia and OECD countries*

2.1 National Developments

Over the past decade, and particularly the last five years, Government policies on education, employment and training in Australia have undergone marked changes in approach and orientation. The aim of these changes has been to establish nationally agreed priorities between State, Territory and Federal governments to guide the allocation of increasingly scarce resources and to create an environment in which employment, education and training form parts of an integrated whole. Some examples of the extent of these changes will be addressed later in this paper.

The fundamental changes made to date will provide the basis for further education, employment and training reforms flowing through the 1990s and into the next century. In other words, what Australia has seen so far is a small scale revolution which is the precursor of far larger developments yet to be realised.

Specific issues and developments being addressed which are relevant to this paper now include:

- raising the overall level of employment related skills and workplace competencies;
- strategies to form a coherent pattern of education, training, work experience and flexible entry to the workforce, focusing on the 15-19 year old age group;
- a nationally consistent approach to the assessment of education and training which links competencies, (including the recognition of prior learning), to jobs which have been redefined, a restructured workplace, and salary levels;
- multi-channelled articulation which links schools, vocational education and training and higher education with industry requirements for competency based standards and nationally consistent skills;
- partnerships between public and private education providers designed to improve the quantity and quality of training for and within industry through competency based approaches which reduce duplication and eliminate review;
- modular school and vocational education courses which enhance open access learning;
- and the design and delivery of self-paced learning through regional and remote centres.

2.2 State and Territory Developments

Australia is a federation of sovereign States and Territories. State and Territory Governments have the prime constitutional and funding responsibility for education and training while the Commonwealth Government has the major responsibility for employment and labour market programs.

Developments at the national level, of the type listed above, are therefore being paralleled at State and Territory level in a number of ways. For example, most States and Territories now have integrated departments dealing with employment, vocational education and training. A number of States and Territories have one Minister responsible for the entire employment, education and training portfolio as does the Commonwealth.

The States and Territories have also agreed to mutual recognition of vocational education and training which ensures a 'national' approach to curriculum development, assessment and reporting methods and which ensures clear parallels between courses offered by different institutions in different locations.

2.3 The impact of developments overseas

Historical and recent developments in vocational education and training, in several Western European countries, the United States, Japan and ASEAN countries such as Singapore, were considered crucial to informing Australian practices. In 1990, a tripartite mission (Govern-

ment, business and trade unions) was sent to examine and report back to Commonwealth, State and Territory Ministers. The main purpose of this mission was to bring to Australia those experiences of other countries which would be useful in helping to reshape vocational education and training and to assist with local readjustment.

On completion of the mission, a detailed paper: *Report of the Overseas Mission to Study Developments in Vocational Education and Training* (1990) was published.

The Report states in part:

> The process of structural adjustment is currently high on the agenda of most OECD countries and a number of other countries are experiencing similar problems to Australia's and see vocational education and training as an important component of necessary strategies. For example:
>
> - The Federal Labour Department in the USA is moving to modernise and expand its apprenticeship training arrangements and is considering ways in which the differences between the States can be rationalised;
> - A major tripartite review of the need for structural adjustment has recently been completed in Canada and a strategy developed whereby the Federal and Provincial Governments will work towards a better co-ordinated approach to vocational education and training;
> - In the UK, a National Council for Vocational Qualifications (NCVQ) has been established as a means of addressing regional and industry differences with the role of industry lead bodies being particularly relevant. A comprehensive study of training in Britain has been recently completed, a National Training Task Force is in operation and a four year program to set up a network of Training and Enterprise Councils (TECs) is underway;
> - In the EC (EEC), there is a requirement that consistent standards be developed by the early 1990s for the accreditation and recognition of vocational qualifications; and
> - In (West) Germany a substantial rationalisation of occupational classifications has been undertaken by the Federal Institute for Vocational Training (BIBB).

In developing new models, the mission recommended that:

> the integrated development of Australian education and training systems, to extend beyond entry level training and provide a basis for life-long learning by the workforce, be recognised by Ministers and the Australian Education Council as a priority area for collaboration between Education and Labour Ministers in the development of a comprehensive national vocational education and training strategy.

Among the findings of the Report were:

- That most countries were adapting to the influences of:
  - increasing globalisation of national economies with increased concern about comparative advantage against trading competitors;
  - the impact of changed demography (especially in OECD countries) with smaller cohorts entering the labour market and ageing populations, leading to concerns with skill shortages, and
  - the impact of changing technologies on work organisation and skills.
- That in the Management of vocational education and training there was clear separation of policy and delivery mechanisms and a marked trend towards local (as distinct from central) decision-making and management.
- That most countries were looking at:
  - breaking down the traditional separation of education between schools, colleges and on the job training, and
  - reform of school curriculum, standards and testing to increase the extent to which education is competency based and relevant to the on the job and life applications.
- That the further education of those not going on to higher education has received much greater attention through the integration of education and training (such as in Germany, Sweden and Singapore where a national commitment by all levels of Government, employers and unions has virtually ensured participation of young people to the age of 19). Australia's lack of such 'across the board' support for integration was seen as hindering national development.
- With the notable exceptions of (then West) Germany and Sweden (where it is not an issue because it has already been achieved) most countries are upgrading the status of vocational education and attempting to link vocational and general education more closely.

In consideration of these findings and the models examined, the Mission:

- 'Supported the recommendations of the Australian Education Council Working Party on School/TAFE links which advocated further investigation of alternative structural arrangements for TAFE and secondary schools in the 11th and 12th years of education';
- 'Noted the innovative approaches now being introduced into the upper secondary school curriculum in Australian schools in order to enrich their vocational content and provide more preparation for work and supports further development of vocational training for upper secondary students';
- 'Recommended that the integrated development of Australian education and training systems, extend beyond entry level training and provide a basis for life-long learning by the workforce, be recognised by Ministers and the Australian Education Council as a priority area for collaboration between Education and Labour Ministers in the development of a comprehensive national vocational education and training strategy'.

The first steps in the implementation of these processes are the strategies contained in the Finn Report (see 2.6) and the recent proposals from the Australian Vice-Chancellor's Committee responding to the Report which propose the introduction of joint foundation courses in higher

education and TAFE. Under this proposal, consideration will be given to introducing a two-year module, to be designed in collaboration between TAFE and universities, and offered through either TAFE or higher education institutions.

The first year would consist of a common module offering foundation studies in language and literacy competence, numerical and mathematical skills and competence, other humanities and natural and social science studies.

After the completion of one or two years, students could opt to take either a higher education oriented year, which would provide a credit transfer to a higher education award course, or take a more para-professionally oriented course which would lead to a TAFE award.

2.4 *Strategies to form a coherent pattern of education, training, work experience and flexible entry to the workforce (with particular reference to the problems facing the 15-19 year age group)*

Initial strategies for improvement ran into problems because of serious and unforeseen discontinuities (i.e there were many missing pieces in the new jigsaw puzzle).

For example, the whole 'educational' technology and 'deliverability' of competency-based training and assessment took much longer to design and develop than anticipated. However the most difficult problem was the definition of general levels of skills standards able to be used across specialist industries, applying these standards to individual industries and their trades and then getting the agreement of employer, unions, government and wage fixing tribunals.

It became clear two years into the process that the achievement of the theoretically possible improvements depended on the structural design and meshing together of a coherent pattern of education, training, work experience and flexible entry to the workforce. In particular, a great deal of rethinking was required about the key strategic interface group the 15-19 year old age group.

2.5 *Australia's National Training Board*

In order to achieve an effective and coherent vocational education and training system a National Training Board (NTB) was established. The NTB is systematically defining those competency standards which have national applicability and which are transferable between jobs or occupations. The National Training Board describes them as core standards which provide the basis for both broad-skilling and up-skilling of the workforce. Core standards were seen as essential in the efficiency and effectiveness of the design and delivery of training programmes.

The NTB has identified competencies which are common to a range of occupations, industries and enterprises. National core competency standards will comprise those required in an occupation generally, together with those specific competencies required by a particular industry sector or enterprise.

It is expected that these mechanisms and processes being developed for vocational education, employment and training will promote life-long learning, create career pathways and provide the basis for articulation and credit transfer. In his concluding address setting directions for the National Board of Employment, Education and Training, Dr G Ramsey then Chair of the Board stated:

> This approach to vocational education and training is about allowing people to enter education and training at a variety of levels from a variety of pathways at different stages of their working lives and to be able to re-enter as often as their needs require.

2.6 *Young people's participation in post-compulsory education and training: Report of the Australian Education Council Review Committee (Finn Report)*

The Finn Report of July 1991 is the most comprehensive report on the education and training needs of Australia in the last two decades. The Review Committee was chaired by Mr Brian Finn, General Manager, IBM Australia and New Zealand. Its Deputy Chair was the Vice President of the Australian Council of Trade Unions, Mr Laurie Carmichael. Findings and recommendations are detailed in Section 3.2.2.

The Report presents a range of recommendations which will result in substantial shifts in the number and diversity of young people participating in education and training. It is widely regarded as the most significant report on Australian Education of the decade.

2.7 *National Consistency*

The work of the Review Committee, the work of the National Training Board and complementing activities in the States and Territories are converging to create for the first time in Australia's history:

- national coherence
- national consistency
- national benchmarks
- national reporting
- national targets to raise overall levels of education for the whole population from Year 10 now to Year 12 in 1995 and to a post-year 12 academic qualification in 2001.

Some key elements include:

- national collaboration in school curriculum and assessment from years 1-12 in English, Mathematics, Science, Technology and Social Education;
- national core curricula projects in TAFE for major trade training courses;
- the National Training Board's approach to core standards for competency levels and their progressing upgrading, and
- competency based training and assessment in the workplace and progressive linking to new pay awards for all vocations.

2.8 Articulation

One of the critical factors which has impeded structural adjustment potential across and within industries, and access to further education in rural areas, is the existence of institutionalised barriers between different sectors of education. It is common in many countries for school-based education, vocational education and training and higher education to be seen as discrete or discontinuous elements with no obvious or logical connection between them. When continuing or further education is added, the problem appears to be compounded still further.

Put simply, except for those 25% of students who have followed classic institutional pathways to University, the great majority of the population, and particularly those without ready access because of remoteness or because they are beyond the school leaving age, further education progress is impeded by a bewildering array of barriers.

Frequently, differences between the education sectors are the result of historical developments with, for example, the trade or technically qualified, educated in vocational institutions, being seen as quite separate from the professionals educated in universities. In reality the nature of the education actually offered reveals quite marked parallels. For example, there is substantial overlap between a Diploma in Engineering offered by a TAFE College and a Bachelor of Engineering offered by a University.

Increasingly, governments and institutions are turning to ways which can minimise or eliminate apparent and real differences between the sectors. In some cases differences exist only at the perceptual level. Whether perceived or real they obstruct progress towards wider educational and labour market readjustment and stand in the way of economic progress by impeding the free movement of workers and the upgrading of skills for those in rural areas who lack easy access. In some quarters there has been increasing pressure for the acquisition of formal academic qualifications and certificates in seemingly discrete and disparate disciplines, yet opportunities for the growth and development of skills, instead of being cumulative are fragmented and full of barriers.

The major impetus for changing existing arrangements between institutions in different sectors and within the same sector, did not come from educators - a minority of whom had long been

vocal on the issue but without significant success. Instead it came from a decision in August 1988 to establish a new Australian wages system. The major elements of that decision were directed to the revision of job classifications, multi-skilling and the provision of new career paths. The decision provided a **structural efficiency** principle as a key element in the new system of wage fixing. To put it simply - instead of industrial bargaining power being the main determinant of wages - payment for level of skill became the driving force.

The structural efficiency principle then established has become a catalyst for award restructuring in a range of Australian industries. It has galvanised employers, employees, educators and trainers through a common incentive. While there are differences from industry to industry, common features of the principle are:

- 'broad banded' job classifications encompassing a wide range of tasks, functions and/or skills;
- opportunities for progression from the lowest skill level through to the highest skill level within an industry with accompanying salary increases, and
- structured programs of skill acquisition, both on and off-the-job, providing the opportunity for all workers to develop the skills necessary for advancement along new career paths.

Pressures from decisions based on the structural efficiency principle, together with the impact of award restructuring more generally, have provided the basis for re-examining existing structural links in education and have stimulated attempts to bring about a rationalisation of educational resources by eliminating discontinuities and barriers.

2.8.1 Articulation: Vocational Education and Training and Higher Education

Decisions on the structural efficiency principle paralleled reports published by the National Board of Employment, Education and Training (NBEET), *Higher Education: A Policy Statement* and *TAFE 1989: Commonwealth Programmes and Priorities*. In these, the Government expressed concern about the ad hoc and inefficient nature of existing credit transfer arrangements within and between the higher education and TAFE sectors and indicated its commitment to improving the situation.

In February 1989 the Commonwealth Department of Employment, Education and Training (DEET) and the National Board of Employment, Education and Training (NBEET) agreed to fund a joint study relating to credit transfer practices in the higher education and TAFE sectors. Results of the study would assist in developing a strategy to address the credit transfer problem.

Results of the study were published by the National Board of Employment, Education and Training in August 1989 as *Credit Transfer: A Discussion Paper* which was followed several months later by a seminar attended by key employee and employer bodies, representatives of Government, educational institutions, learned societies and the wider community.

Credit Transfer: A Discussion Paper concluded that Government should reaffirm a policy of supporting fair and equitable credit transfer arrangements by higher education institutions and by all TAFE systems. These should provide for students wishing to transfer within either TAFE or higher education or from one sector to the other.

Thus articulation, or credit transfer arrangements should provide for lateral movement of students within one sector (i.e. from one TAFE college to another or from one university to another) with minimal disruption and optimum efficiency. They should also provide the means to enable students to move from one sector to the other (i.e. from TAFE to higher education and from higher education to TAFE). Moreover, arrangements should ensure that students are provided with the optimum amount of 'advanced standing' ("credit") towards the award of a qualification from that sector or institution into which a transfer is made.

Australia now has many examples of credit transfer arrangements concluded between TAFE systems and higher education institutions which provide a sound basis for longer term optimism. The Australian Capital Territory (ACT) provides such an example. Vocational education and training in the ACT is conducted under the auspices of the ACT Institute of TAFE, a single institution with numerous campuses which delivers some 20 million hours of annual student class contact. In the late 1980s, the ACT Institute of TAFE concluded a formal written agreement with the then Canberra College of Advanced Education (now the University of Canberra) which provided clear, unambiguous statements about the entry and advanced standing that TAFE students would gain in the higher education programmes it offered.

2.8.2 Articulation: Vocational Education and Training in Schools

The preceding section discussed at some length articulation arrangements between vocational education and training and higher education. Arrangements of this type have received most attention in terms of government policies and educational planning. To an extent this focus has been at the expense of arrangements between the vocational education and training and schools sectors which, in the Australian context, have only recently begun to develop stronger links.

Australian school education is predominantly comprehensive in nature with the majority (75%) of students attending Government primary and secondary schools. Australian schools have never been characterised by institutionalised differences of the type once seen in Britain where secondary education was formerly divided into grammar, comprehensive and secondary modern schools with a smaller number of technical high schools.

Participation in schools in Australia is generally compulsory to Year 10. The retention rate from Years 8 to 10 is 98%. Approximately 80% stay on for year 11 and some 64% remain at school to Year 12. (ABS Catalogue No. 4221.0 *1990 Schools Australia*.)

Participation rates are highest in urban areas with lower participation in rural areas mostly due to access problems.

While Britain has moved away from secondary education with a more clearly defined 'focus',

countries such as Holland and (West) Germany maintain a streamed secondary sector which has 'general' high schools, and technical high schools which prepare students for technical and para-professional careers while gymnasia or grammar schools prepare students for higher education entrance.

Nonetheless, in recent years, as secondary retention rates in Britain have grown, particularly in the senior secondary sector (i.e. 16 to 18 year olds), there has been a clear realisation that school curricula designed largely for academically oriented students were not suited to the needs or aspirations of the majority of students remaining in full-time secondary education. This realisation gave rise to innovative and successful educational strategies such as the Technical and Vocational Education Initiative (TVEI) which saw the introduction of practical based and vocationally oriented curricula into senior secondary education with consequent benefits for the schools, students and the labour market.

Currently in Australia, retention rates are increasing in senior secondary education and most curricula have been designed for academically oriented students. It is a social as well as an economic imperative that this is rectified speedily.

There are a number of ways of addressing this issue. They include the introduction of curricula similar to Britain's Technical and Vocational Education Initiative projects, increasing access to vocational education and training institutions and articulating vocational education and training programs into senior secondary education. Mechanisms for this include joint accreditation and mutual recognition by school and vocational education and training authorities.

Given that vocational education and training institutions already have extensive curricula, assessment and accreditation methodology, the latter option seems to present a cost-effective and expedient way of dealing with a large number of young people whose career orientations are essentially practical or vocational.

Within Australia the experience at the state level suggests that while there is initial resistance from the authorities responsible for school curricula and assessment to the introduction of vocational education and training programs, these can be quite successfully integrated through joint accreditation and by providing students with optimum educational outcomes and a greater degree of flexibility in career choice. This has been the experience in the Northern Territory.

An example of recent developments can be seen in the treatment of metal trades training modules arising from the industrial salary award restructuring process noted earlier. As part of this process key employer and employee bodies and Australia's National Training Board have supported the development of an integrated career structure for workers in the metals and engineering industries. This broadly means that salary levels are formally tied to the recognition of skill acquisition which reaches from the unskilled manual labourer to the highly skilled professional engineer.

In order to facilitate this development, a new national metals 'curriculum' was developed which

was suitable for delivery in a range of locations including the workplace, vocational education and training institutions and schools. The curriculum comprises increasingly complex modules, each of which is tied to a particular group of skills or competencies and which are subsequently reflected in the career and salary structure of the industry.

It has proved quite straightforward to introduce what are often termed the 'metals modules' into Northern Territory secondary schools, providing students with jointly accredited subjects with national recognition. Most importantly, the first steps on a career ladder will have been completed prior to finishing compulsory education.

2.9 Educational Partnerships

As a consequence of award restructuring, industry is expected to take a greater responsibility for training its employees. Industrial organisations including Industry Training Advisory Boards, Industry Training Committees as well as Industry Associations (private providers) have sought recognition as Registered Industry Training Agents under the provisions of the Training Guarantee legislation. At the enterprise level, industry is already a major provider of training. Industry has also begun to establish joint ventures with public providers to increase the opportunities for skills development.

As a result, the number of private industry-based training providers has grown significantly. Today they are a major component of the vocational education and training infrastructure and a number will compete with and complement public sector training providers. It is expected that active competition for training funds will encourage both private and public providers to be effective and innovative in the delivery of services.

Wholesale industry restructuring as part of award restructuring is providing vertical and horizontal pathways for the workforce and has increased the need for articulation and credit transfer arrangements between deliverers of traditional technical education and those primarily responsible for higher education. As indicated in earlier sections, until recently there had been little or no articulation or credit transfer in Australia between the two education sectors.

Within industries, restructuring and the need for greater competitiveness and productivity are having a major impact on Australia's training system. Private and public training systems now need:

- more assistance in the assessment, redesign and implementation of the skills formation systems;
- providers of teaching expertise to complement industry expertise which together will complement TAFE staff in institutions, and
- provision of appropriately designed and structured learning materials.

In line with the general thrust of the restructuring process, training must facilitate multi-skilling,

multiple entry and exit points and re-training. Demand for education and training will increase across all industries, and in particular from workers in semi-skilled and post-trade areas. A reorganisation of work and new technology will change the skills 'mix' required for workers.

A Northern Territory example of recent developments in approaches to industrial training can be seen at Nabalco. Nabalco, a major international producer of bauxite, is situated in a remote environment some 500 kilometres from the nearest town of any size. All skilled staff replacements have to be flown in from elsewhere. Here cross-trade training was established for tradespeople, half of whom were electricians and the other half instrument fitters.

Those who were electricians trained as instrument fitters and those who were instrument fitters trained as electricians. This resulted in dually qualified workers, providing the company with a substantially richer human resource base and greater workplace flexibility, which is essential in a remote location with staff recruitment delays. It also provided the employees with more marketable job skills, opened new career pathways and improved workplace relationships between the employer and employees.

The competency based system employed at Nabalco provided all on-the-job training which was accredited by the Northern Territory training authority. The Institute of TAFE in the Northern Territory University (the largest local provider of vocational education and training) in cooperation with the TAFE authority of Queensland (a neighbouring State), designed the curriculum content and delivered the 'off-the-job' training components.

The outcomes of this process proved to be not only an exercise in flexible delivery but provided clear evidence of the effectiveness of industry-government partnerships. Cross-trade training is now established as one method whereby the worker skills 'mix' can be updated and improved.

Higher levels of vocational and further education and training is a critical factor in the success of most industries. Australian industry has tended to have a lesser commitment to training than many other countries. Now a structure is in place to influence industry management to invest in training although industry also needs to be convinced that there is a capacity on the part of existing public training providers to work with individual industries to meet their needs.

2.10 Modular Curriculum - implications for closing the urban-rural gap

In an increasing number of countries including Australia there is widespread acceptance that education and training are non-lifelong experiences which increasingly require changes to entry and exit points and to modes of teaching and learning. The underlying principle here is one of educational and consequently social and economic empowerment for individuals and groups who are not only encouraged to remain in or return to education and training, but who can see the real benefits arising from the acquisition of improved skills, increased knowledge and better career and employment prospects.

The principle of lifelong education and training should be seen in parallel with national and international developments in the recognition of prior learning.

Nowhere are these changes more clearly defined than in school and technical and vocational education curricula, which are moving towards a modular or unitary approach.

In essence, modular curriculum design can enable a large and complex curriculum to be rebuilt as a system of separate but interrelated units commencing at the simplest and leading by progression to the most complex or to a far wider understanding of the discipline in question.

Students begin with introductory material in one discipline or subject area such as the 'metals' modules mentioned earlier. They proceed through units of either increasingly difficulty or greater breadth up to the point where they either complete a formally certified qualification, or they reach a level which meets immediate or longer term career needs or which provides the basis for further technical, paraprofessional or professional training.

There are a number of clear advantages to modular curriculum design. These include the ability to offer units in the workplace, in schools, through technical and vocational education institutions, in the home or in tutorial or open access centres in small towns. As indicated earlier, in this way students can gain wider access to recognised programs of study, often in a flexible manner which is far less tied to the geographic location of expensive, purpose-built education facilities. This may reduce reliance on expensive technical and vocational education colleges in rural and remote areas but still provide certified learning and credentials.

Further, modular approaches to curriculum and instruction appear to lend themselves far more readily to self-paced learning in which it is the learner who sets the rate of progress and the range of material to be covered rather than an institution or instructor. With well designed self-paced learning strategies, teachers and students are able to use a variety of instructional and learning methods which include technologically advanced computer aided packages, audiovisual materials, correspondence lessons, books, checklists, practical experiments and on-the-job experience with 'real time' applications.

Modular approaches also lend themselves to competency based teaching and assessment methods in which the time spent on the task assumes far less importance than attainment of the levels of competency assigned to a particular module or unit. When combined with self-paced learning, competency based teaching and assessment can lead to optimum educational outcomes where students who have rapid acquisition of knowledge or techniques or who have prior related experience pass through units more quickly with no consequent disadvantage to those taking longer to reach the same levels of competency.

Clearly modular approaches have potential to reduce the 'quality gap' between urban and rural education.

At present, shortcomings in Australia's internal communications network mean that modular and self-paced learning cannot be delivered at an optimal level. This is not so much a fault of

the systems themselves but more so of the inherent costs in delivering educational and other services to a nation with a small, widely dispersed population.

This dilemma might be illustrated by reference to the Northern Territory, which is 1,600 kilometres from North to South and 1,000 kilometres from West to East yet has a population of only 160,000 with approximately half residing in one city - the greater Darwin area. Similar situations, albeit not as extreme, exist in other Australian states where the majority of people live in coastal capital cities with vast distances between remote and isolated centres. In South East Asia similar problems occur where island populations are separated by sea or in remote mountain areas.

The need to service a dispersed population places great burdens on existing approaches and on the critical need for innovation in telecommunications and satellite transmission to facilitate the use of alternative delivery methods for education and training. A national working party, led by the Northern Territory, has been established by the Australian Education Council to investigate and establish a national communications framework for education delivery.

The Australian experience of delivering education and training services using technology suggests that the dramatic fall in infrastructure and equipment costs is likely to continue, leading to far greater access and significantly improved economies of scale even for small communities.

It also suggests that methods and approaches developed here can be readily applied, during the next decade, to those countries who are currently upgrading their telecommunication capacities. They are in a good position to use existing and planned technology now that high development and trialing costs are no longer included in the prices charged. Further, the potential exists for several countries to be inter-linked in the near future in a broadcast 'footprint' spanning many regions.

What is also increasingly apparent is the potential for economies of scale using innovative technology now available. For example, Australia's damaging national airline dispute in 1989, which lasted for six months, provided a major stimulus for the use of interactive tele and video-conferencing facilities which provide direct linkages between individuals and groups often separated by thousands of kilometres. Until recently, the cost of video-conferencing has been $A900.00 per hour. This was soon to be reduced by approximately 50%, bringing this form of communication well within the budget of a far larger group of potential users. At the time of writing, one competitor (using compressed video) has reduced their charge to $200 per hour. Each day in Australia, many meetings of Government and private sector officers from Commonwealth, States and Territories take place. The cost of any single meeting of one officer each from each state for airfares and accommodation is $7500. A four hour interactive video conference at the general reduced rate cost $2000. The compressed video conference charge is $1000. Clearly at these prices there is potential for more interaction at a cheaper price.

Some other satellite user costs have dropped by as much as 90% in the past five years.

While there are establishment costs in using these facilities the conclusion is inescapable that a threshold is being reached where the costs of using technology have reduced to the point where they offer a genuine alternative. In opening up opportunities for new and innovative technological approaches to education and training, the savings can be achieved by not having to rely on outmoded, inefficient and unreliable methods. The secret to their use is cost substitution.

In these times of worldwide shortage of educational funds, solutions which require substantial new investment are difficult to implement. If end users agree to reduce costs elsewhere in favour of using alternative approaches then progress will be made this decade.

2.11 Open Access Learning Centres

The Australian model for Open Access Learning Centres has evolved from several distinct areas:

- Primary Schools of the Air (using mailed correspondence lessons augmented by radio links);
- Secondary Correspondence School (using mailed correspondence, telephones and facsimile), and
- 'Conventional' TAFE and Higher Education institutions which have catered for external students, that is students who are unable, for a variety of reasons, to participate in regular or conventional classes.

An open access learning centre provides support and teaching/learning materials for all students who are unable to make use of regular classes. It uses a variety of media for this including print, video and audio tapes, broadcast and computer software and interaction.

Examples include the Alice Springs and Katherine Schools of the Air, and the participants in the Ministry Telematics Network Support Project (Victoria).

In Australia, Federal Government funding has been allocated for the investigation and development of an initial framework supporting a national open learning network. To this end, a working party of the Australian Education Council, has formulated a National Education Communications Framework (NECF). The working party has proposed the establishment of a National Collaborative Educational Communications Authority (NCECA) which would develop and implement the NECF and would pursue the goals of improving the standard of education and training through improved access and equity.

Suggested strategies for the NCECA as manager of a National Open Learning Network are discussed in the next section 3.

3. *The development of a national communications framework for the delivery of formal and non-formal education and vocational training services and its impact on rural areas*

DEFINITIONS

FRAMEWORK:
A framework is a set of statements that guide and facilitate action by describing:

- a set of principles for operations
- parameters that are encompassed
- guidelines for strategy and planning.

NETWORK:
A network is a structural arrangements for specific communications (eg: a physical network as in the PSTN, TV network, AARNet, or national railway system), or a human network such as a User Group or Common Interest Group.

COMMUNICATIONS TECHNOLOGIES:
Communications technologies are those technologies involved in the transfer of information or messages between a transmitter and a receiver.

3.1 Factors influencing current developments

During the 1980s a number of reports to Education Ministers and to the Federal Government called for concerted action by the education community on a national basis to ensure that the developing telecommunications technologies were being used to improve the teaching-learning process. These reports were not taken up because of the initial very large capital costs for purchase and installation and high running costs. At the same time, traditional class teaching and lecture methods were cheaper and more effective at least for those in normal classes. At that time, delivery of education using the full range of communications technology via satellite was costed as being similar to the costs of providing a 'personal professor' for each student!

In April 1989 following the disappointing take-up of satellite applications for education during the three years after the launching of AUSSAT, the Australian Education Council (AEC) established a working party to report on the use of satellite communications in distance education in schools, colleges (K-12) and TAFE. The task was subsequently extended to encompass all the other telecommunications technologies which may be used in education delivery. This working party was able to demonstrate in 1990 that, with available technology

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and applying outcomes of pilot projects, costs were sufficiently low to make new delivery mechanism economically viable for urban and rural Australia.

3.1.1 The current National Working Party

In April 1991 Ministers agreed to establish a National Working Party chaired by Mr G.J. Spring, Secretary of the Northern Territory Department of Education, with representatives drawn from schools, TAFE, Higher Education and from the industry and business sectors to develop a National Education Communications Framework (NECF).

This NECF working party is doing more than just identifying opportunities for using communication technology to deliver education and training in schools, TAFE, Higher education and within industry. Its charter is to undertake the necessary investigations into appropriate standards and protocols necessary to implement a National Framework.

The Framework will also include the development of working relationships with industry in order to continually monitor development and to make recommendations on practical implementation. These relationships are particularly important in the context of the changes in profiles of delivery across the education sectors which may result from the implementation of the report on *Young People's Participation in Post-Compulsory Education and Training* (Finn Report).

The NECF will include reference to the following specific education and training functions:

- encouragement of the utilisation of innovative alternative means of learning delivery;
- promotion of national research and development of educational programs by facilitating electronic communication between curriculum developers;
- strengthening of working relationships with existing electronic communications networks such as AARNet (the existing higher education E-mail network);
- promotion of the professional development and inservice training of teachers by facilitating the sharing of expertise nationally, and
- facilitating national access to education and training where expertise is not universally available throughout Australia.

3.1.2 Positive forces contribution to the NECF

The positive forces contributions to the NECF are:

- the emerging client needs spelt out in Section 2;
- access to service and to better quality of service particularly for those currently disadvantaged such as those in rural areas;
- increasing mobility of some parts of the workforce;

- the need for a consistent national competency structure and also to present a stable unified structure to overseas companies and families planning to establish in Australia;
- the impact of restructuring in industry;
- training and retraining of the existing workforce for new technologies;
- flexibility of the workforce through multiskilling and retraining;
- declining State and Territory budgets for educational and training delivery;
- reduced research and development funding;
- the potential for improvement of service delivery through:
  - minimisation of duplicated effort,
  - national collaboration in the redesign of curriculum,
  - modular approaches,
  - productive use of communications technology,
  - alternative delivery modes such as Open Access Learning Centres.

3.1.3 Negative Forces Which the NECF May Overcome

The Working Party was presented with a range of 'blockages' which needed to be cleared, including:

- a confusing array of licensing arrangements at Federal and State level for the use of different media (i.e. line, satellite, television, data transfer, AM, FM, HF and UHF radio, etc);
- monopolies in key service areas such as telecommunications (soon to be broken with the establishment of a second competitive carrier in Australia);
- the assumption that the best way for teaching and learning to occur is by having teacher or lecturers and their pupils or students in an enclosed space for regular blocks of time;
- lack of national collaboration and State and Territory differences such as having 8 school educational systems and 8 TAFE systems for 17.5 million people;
- cross-sectoral rigidities in the education and training sector, and
- cost factors as explained above.

Australian teaching services have traditionally been slow to fully adapt to changes in technology, methodology or social climate. Accelerating such changes is difficult without redeployment of resources into the training and in-service education area and into a supporting infrastructure. Concerted programs to change the expectations behaviour and techniques of teachers to use more efficient new technologies must be implemented.

3.1.4 Distance Education

For its tasks, the Working Party uses the term 'distance education' very broadly to include correspondence education, external studies and a range of open learning approaches. This reflects the general structural and policy directions which school, TAFE and Higher Education

systems across Australia were taking because the new context is now far broader than services to remote areas. It includes all individual learners whether they be studying at home, in hospital or in the workplace.

This wider focus reflects the essential dilemma the Working Party was set up resolve. Individual schools, colleges, universities and education systems, as well as reaching their traditional specific client groups in rural and sparsely settled areas have also been expanding their use of telecommunications for the delivery of mainstream education services in the cities and towns. Yet each system had been unable to sustain the necessary level of technical and operational planning and development in all areas to maximise cost savings. Nor could systems choose, let alone effectively employ, all the most appropriate technologies available. Apart from trial or pilot projects and a number of ongoing but still 'one-off' applications, the full potential offered by the technology to deliver a better service to most potential clients has not been realised.

3.1.5 Reaching a "Threshold" for Taking Action

The availability of the technology and the burgeoning needs caused by the new developments mean that there is now a critical imperative for focused national collaboration by education systems in the use of telecommunications technologies for education delivery. The business sector is increasingly placing a high priority on the value of educational communications technology within enterprises. The business sector is a driving force in the pursuit of a national framework, particularly where partnerships occur in the delivery of training in the the workplace.

Technologies such as telephone, radio, television and computers are becoming integral to daily education programs in each school, TAFE and Higher Education system but, as indicated above, still at a relatively low level and still partly experimental.

The development of a national framework is also seen as integral to support initiatives in curriculum collaboration and in efforts at achieving more efficient and cost effective course delivery, economics of scale and much improved utilisation of resources.

The current trend is towards more flexible delivery methods. Taking into consideration recognition of prior client learning, broader entry into programs at multiple points and the need to offer 'on-demand' learning, using point-to-point communications has provided the impetus lacking in the 1980s.

While the development of a NECF is becoming a pressing urgency for Australia it is pertinent to draw comparisons with Australia's history of railway construction where interstate jealousies produced different railway gauges for each State requiring transhipment of goods and passengers at State borders. The cost penalties of each State 'going its own way' with communications technology in education are likely to be as far-reaching and as long lasting. Broadly, the NECF will give guidelines towards the goals of improving excellence in education

and training, providing improved access and equity and achieving these goals within acceptable budgets.

3.1.6 Managing a 'Mosaic' of Communications

A NECF is likely to give rise to a 'mosaic' of communications across Australia at all levels and in all sectors, and will require management and coordination. For this reason, a national coordinating body is being proposed, tentatively called the National Collaborative Educational Communications Authority (NCECA).

Access on a contractual basis to expertise existing in agencies in all States will also be required. There is unlikely to be a single source of expertise for national distribution of education and training. States and institutions within States have agreed to work collaboratively to improve the quality and access to education and training, but will nevertheless retain responsibility for providing curriculum and courses within their States.

It is expected that educational institutions will cooperate with public and private enterprises which provide access to expertise concentrated in a small number of locations and then disseminate it using the NECF throughout Australia.

The proposed NCECA is therefore likely to be a central clearing-house which identifies where expertise is to be found for all aspects of technological delivery around the nation. The identification of human, material and technical resources will all come within its scope, as well as coordination of the application of these in a collaborative manner at the national level.

3.1.7 Why Now When Earlier Attempts Have Failed?

It is an appropriate time for educators to consider establishing a NECF. Many countries in the Asian region are upgrading their telecommunications capacity, for example Indonesia. During the eighties, educators were encouraged to use communications such as satellite technology. However, very few irreversible decisions have been made regarding communications technology. Some countries may have made significant investments (as some Australian States have) in audiographic and E-mail systems. However, in general, educational institutions are well poised to take advantage of the technology and products increasingly becoming available for 'on demand' study at work, at home or in training institutions and in associated rural locations.

The forces in many countries moving TAFE delivery away from large class groups progressing through colleges in a lock-step mode towards highly individualised open learning delivery systems might mean that the greatest value of a NECF for TAFE towards the end of this decade will be collecting and downloading training materials to commercial enterprise sites and to networks of open learning centres based in schools, colleges and associated centres in rural areas.

In most countries, industry requirements are directing TAFE activity more strongly than in the past. TAFE institutions will continue to provide a range of courses to adults who are not in an industrial setting. These will be people who are actively seeking to rejoin the workforce through skilling themselves, or acquiring basic skills which they were unable to obtain during their schooling. Open learning techniques which use communication technology will be equally relevant to these groups as they are already in parts of Australia.

A key need in rural areas is either initial study or return-to-study courses for rural women who live in isolated locations.

The financial hardship for rural people who are forced to pursue higher education away from their homes, will in the future encourage higher education institutions to use communications technology to make learning more accessible and less expensive for rural students. It should reduce some of the professional isolation which, along with geographic isolation, is a disincentive to living in rural communities.

An NECF will provide a vehicle to assist learning to become more flexible and client centred. Providing that we are successful in ensuring compatibility of communication protocols and standards between educational systems and providers, people who are now disadvantaged by geographic isolation should have a much wider choice of courses without the need to leave their homes for extended periods of time. It should also provide greater access for those such as the physically handicapped, the homebound and shift and itinerant workers who, for a variety of reasons, cannot travel to a school or college.

Responsibility for training and developing skills in the Australian workforce has previously been given to TAFE and industry generally. The implementation of the Finn Report could also mean that schools will play a significant role after Year 10 (Age 15+).

Training Australia's teachers is largely the responsibility of the higher education sector and the education systems themselves for on-the-job or in-service training. Higher education provides preservice courses while the systems largely provide continuing professional development. Increasingly, both higher education and education systems are looking to use communication technology to improve access and to provide further professional development to a greater number of teachers. Both can take advantage of a NECF to deliver courses.

In summary, accompanying the economic and social imperatives outlined earlier there have been improvements in communications technology and decreases in costs. For some time, educators in all states have undertaken trials with communication technology, particularly for specific regional areas. Developments in mass communication systems such as satellite technology, video compression techniques and improved voice and data encoding and delivery make transmission of voice, data and video images a national possibility for educators.

3.2 Consideration of the key issues as they affect the urban/rural quality gap

The development of a national communications framework for Australia complements the implementation of national education policies in three major areas - national collaboration in curriculum and assessment, participation of youth in post compulsory education and training, and competency based training.

The following section looks at these three areas in detail.

3.2.1 National collaboration in Curriculum and Assessment

Demographic and economic factors play their part in national collaboration. Australia's total population is relatively low. The size of individual States is such that it is both difficult and inefficient to continue to maintain a major and comprehensive curriculum development capacity at the State level. We share this problem with countries in the region who have large provincially based operations or decentralised systems of colleges.

The mobility of families and the need for transportable work skills for national industries have generated a demand by industry and unions for national collaboration on curriculum and assessment issues at all levels of education and training.

The population of rural Australia is declining. There is intense market pressure for more cost efficient farming practices. This combined with bankruptcies caused by low commodity prices and high interest rates has forced the amalgamation of smaller properties into holdings. Where four farms once supported four families, these now are combined into one larger farm which supports only one family marginally. In order to contain education costs for this smaller rural student base, alternative delivery methods which provide for greater economies of scale must be fully investigated.

The rural situation described above has meant a flow-on effect in declining incomes in small rural towns in many areas of Australia. This trend is imposing additional burdens on the parents of country students seeking to pursue post Year 10 education which is not available at home or in their small rural towns. These students would normally seek education in the cities or larger provincial centres. With rural unemployment generally high and rural youth unemployment over 30% many rural youths are trapped.

There are limited education opportunities in their small home towns and for some there are severe financial difficulties in travelling away to study. Open learning strategies which take full advantage of new communications technology will help reduce the burden on these students and their parents.

Collaboration in curriculum writing so far has not taken sufficient account of the design requirements of distance education. The NECF policy statements will recommend that

curriculum designers now take account of the specialised resources and methodologies required for alternative delivery models. Curricula written with only traditional classroom based techniques in mind may be quite inadequate for adaptation to delivery through communications channels to individual learners, whether they learn through open access learning centres, in the home, or the workplace.

There is now an appreciation of the need to build on existing national developments. Further collaboration between States and Territories is seen as highly desirable building on the successful collaboration already undertaken by the National Curriculum Corporation, the National TAFE Research and Development Centre, and the National Australian Cooperative Assessment Program (ACAP). While collaborative developments in curriculum have outstripped those in the assessment area, progress is being made there also on a national level. Agreement about national curriculum is easier to reach than about national assessment.

National collaboration on the design of curriculum and assessment packages is essential to the achievement of uniform national standards of equipment and the ability to negotiate contracts for telecommunications goods and services on a national level. Educators know how to design student materials and teacher materials for classroom use, however the design principles for educational materials are very difficult if the objective is to empower individuals to access education in their own time and their own pace. Modular units are required and learning materials need to be designed around the learner rather than the teacher. Learning modules will need to integrate delivery by television one way and/or interactive television, HF radio, line data transfer by facsimile or E mail, etc.

A substantial increase in the use of television, radio, or data transfer will require national coordination and timetabling of programs with carriers as well as the allocation of priorities for delivery of curriculum designed for open access. This should be undertaken after a 'mapping' of needs identified by each sector in each state and territory.

The NECF will contain recommendations that the Directors of Curriculum (Schools Sector) and the existing TAFE bodies, the Vocational Education, Employment and Training Advisory Committee (VEETAC) and the Australian Committee on Training Curriculum (ACTRAC) liaise with a national co-ordinating body for such activities.

To facilitate this, the Federal Minister has proposed the establishment of a National Open Access Learning Agency to coordinate these developments. A body, tentatively titled the National Collaborative Educational Communications Authority (NCECA), is being recommended which will have the job of managing the NECF.

It is considered essential that advice from an NCECA be available at the outset to ensure that the most appropriate means of delivery are chosen. Initially, priority is expected to be given to areas identified in the Finn Report such as workplace literacy and problem solving and areas which have met the following criteria:

- Areas in which significant national collaboration between State educational institutions has already begun;

- Areas where there is an existing agreement between States to cooperate together for the delivery of national priority programs, and
- Areas where the effective teaching of the course requires costly development of materials.

3.2.2 Increasing Participation in and Raising Overall National Standards in Post Compulsory Education

The recommendations of the Finn Report include raising national education standards from Year 10 level for all, to new national minimum standards as follows:

- at least a level 1 traineeship or participation in Year 12 for all 18 year olds by 1995;
- at least a level 2 traineeship or progress towards a higher level vocational or academic qualification for almost all 20 year olds by 2001, and
- at least a vocational certificate (level 3) or progress towards a vocational qualifications above level 3 or a diploma or degree for at least 50% of 22 year olds by 2001.

This set of targets can be distiled into a single summary target that, by the year 2001, 95% of 19 year olds should have completed Year 12 or an initial post-school qualification or be participating in education and training.

An important side-effect of these recommendations is that there will automatically be a greater requirement for 'distance education' services from all those communities whose local education facilities do not extend beyond Year 10. A second side effect will be high demands from those who have left school. That is, all those above the age of 16 in 1991 in the whole population who have not reached those national targets and who will return to education to achieve them to be competitive in the job and promotion markets.

An equally important side effect is that the range and diversity of subject offerings will need to be increased. All states and territories will need to develop valid and publicly credible nationally comparable ways of assessing young people's attainments in terms of the National Competence Profile Levels in the areas of:

- Language and Communication
- Mathematics
- Problem Solving
- Science and Technological Understanding
- Cultural Understanding
- Personal and Interpersonal.

As a consequence, a review of curriculum development, delivery mechanisms and institutional structures focussing on open learning is inevitable.

Responsibility now for skilling the Australian workforce has been given to TAFE and industry generally. The Finn Report will also mean that schools will play a more significant role both in the compulsory years and particularly at Years 11 and 12.

Skilling Australia's teachers is largely the responsibility of the higher education sector and the education systems themselves. Higher education provides preservice courses while education sectors largely provide the ongoing professional development.

Increasingly, both the higher education sector and education systems are looking to use communication technology to improve access and to provide more ongoing professional development to greater numbers of teachers. Both can take advantage of technology to deliver courses.

3.2.3 Competency Based Training (CBT)

As indicated earlier, there has been increased cooperation between TAFE colleges to develop learning to an agreed content, quality and national standard set by the National Training Board. By drawing on the expertise of course developers Australia-wide there is the possibility of raising the quality of training and education which students receive. Increasingly, training is being evaluated on its contribution to improving organisational performance and productivity. This leads to pressure for faster responses from training institutions to meet industry needs and for increased relevance of courses to skills development. Many TAFE training programs are increasingly meeting nationally set goals for content, and are focusing on competency-based approaches.

This together with the developmental work which will flow from the Finn Report's emphasis on key competencies will strengthen the need for national coordination of curriculum and assessment. In order to deliver these competencies/outcomes a nationally coordinated approach to the use of an educational communications technology is considered an essential adjunct.

3.2.4 Client Needs for Delivery via Technology/Distance Education Techniques

The proposed NCECA will need to examine client needs from three separate viewpoints - those of potential students, of the educational service providers, and the broader view of national coordination in needs analysis and demand assessment.

Student needs will relate to their capacity to participate in terms of their physical condition, location or environment, their specific needs for particular course matter in terms of its availability nationally or locally, and their resource needs in terms of materials and technology.

Provider needs will relate to their capacity to provide courses and resources. There are many factors to be considered here, such as:

- availability of the relevant collaboratively produced curriculum;
- availability of suitably skilled staff with regard to communications-based delivery (and related teacher-training considerations);
- availability of appropriate resources/funding for equipment and connection charges as appropriate for each delivery task, and
- the need to ensure that national coordination does not seriously disadvantage providers, and permits equitable sharing of courses.

Needs analysis and demand assessment will be required on a broader front than has previously been necessary. Measurement of demand for courses for isolated students need no longer stop at one's own borders. Where an organisation is the only provider of a particular course, it may no longer matter that a student is in another State 3000 kilometres away. To date, our distance education has generally been delivered over small local networks often governed by pre-satellite transmission ranges or the availability of line connections. In addition to measuring existing demand on a national level, the proposed NCECA is expected to be involved in anticipating needs for educational telecommunications services nationally, for which it may need to monitor demographic and industrial trends.

3.2.5 Improvements in Programs and Services

There are seven significant areas in which the proposed NCECA has the potential to bring about major improvements.

(i) **Equity of access**

Many potential students in all sectors of education are presently unable to access educational opportunities in the quantity or of the quality available to mainstream urban students. Reasons for such inaccessibility are numerous, including geographic isolation and physical handicaps as well as work or domestic commitments such as shift-work, child care and so on. Telecommunications applications can help to redress these inequities and assist in meeting national educational policies on equity and access as well as participation targets).

(ii) **Quality**

In the current economic climate, stringent education budgets will require closer scrutiny of expenditure to ensure that outcomes are maximised. Telecommunication systems through economies of scale provide one way of increasing educational returns.

(iii) **Cost-effectiveness**

There is presently much duplication of effort in the development of curricula, methodology, materials and equipment for communications-based delivery of education in Australia. This situation creates the risk of mutually incompatible systems becoming entrenched within individual state systems. There is real potential that

reductions of costs and wastage can be achieved through national coordination in this area.

(iv) **Coordination strategies - learning resources**

There is a need for national strategies to integrate telecommunications into existing and future national collaborative initiatives while allowing flexibility in accommodating state and regional requirements. Advice towards such strategies would most properly come from a body such as the proposed NCECA.

(v) **National purchasing**

The NCECA should enable maximisation of the purchasing power of the Commonwealth, States and Territories, while allowing them to participate in contracts on a voluntary basis.

3.2.6 Relationships With Existing Agencies

Proposed and existing state agencies have functions which impact on the NCECA. There will be a need for an interface between the NCECA and these agencies.

The Multi-Function Polis (MFP) is a national project, sited in Adelaide, which initially is focusing on the environment, education and information/computing technology as development themes. The NCECA will need to interface with the MFP.

3.2.7 Initiatives for Change

To further strengthen the benefits which will accrue to education nationally as a result of sectors, (Universities, Schools, Colleges) responding to the range of imperatives and their implications previously elaborated, it is being proposed that a number of pilot projects be supported which will demonstrate the application of the NCECA to existing activities.

The Directors of Curriculum (Schools sector), the Vocational Education, Employment and Training Advisory Committee (VEETAC) and the Australian Committee on Training Curriculum (ACTRAC) in association with the NCECA will determine priorities for the projects. This should be undertaken after a mapping of needs identified by each sector in each State and Territory. The advice of the NCECA is essential to ensure that the most appropriate means of delivery are chosen.

It is clear that the benefits which the national curriculum initiatives hold for the schools sector can be supported by the NCECA through curriculum and teacher support projects made available nationally or between systems.

3.2.8 Quality Assurance

The NCECA will have the capacity to advise on procedures to ensure appropriateness in design of curricula and implementation strategies for courses to be delivered by telecommunications techniques. The design of courses accessed via communication and related technologies needs to be appropriate to:

- the needs and circumstances of the learner;
- the purposes and outcomes of the course;
- the available level of financial and material resources;
- the available learning technology systems and strategies, and
- the delivery institution.

In order that quality can be assured, performance indicators will need to be developed for each of the following stages in the development of the course:

- specification of learning outcomes and related experience;
- mapping of the learning environment;
- specification of learning and delivery strategies;
- specification of learning materials, tools and support systems, and
- development and production of learning materials packages.

3.2.9 Relationship With Private Sector Educational Service Providers

Private training providers now make up a significant industry. Some of these such as the IBM system are virtually closed systems, while other providers advertise publicly for clients. Because of the sensitivity of some commercial training, satellite transmissions would need to be encripted if the NCECA organisation was to cooperate closely in delivery of education and training with private educational providers.

The following possibilities exist for cooperation with private sector educational providers:

- sharing communication facilities - for example, some remote mining sites in Australia have mobile Telecom Iterra satellite communication facilities which could be used for delivering training;
- opportunities for private sponsorship;
- provision of instructional design expertise by educational institutions to private educational providers;
- private sector school systems and independent schools using a National Collaborative Educational Communications Authority in several ways such as
  - smaller private sector schools, particularly in rural locations are beginning to examine ways of cooperating together to share scarce educational resources and small classes, while at the same time preserving their autonomy,

- larger independent schools are also looking to use communications technology to link dispersed sites together to save teacher and student travel,
- some larger independent schools are becoming interested in offering International Baccalaureate courses to maintain enrolments of boarding students - there may be some opportunities eventually for delivering these courses through a NCECA or of marketing such courses.

4. Partnerships between the school and the community

4.1 The Concept of Partnerships Between the School, the College and its Community

Throughout the world there are few countries not currently engaged in devolving aspects of educational decision making to the provincial, regional and school or college levels. There are many models. For example, in some systems the aim is administrative devolution - the self managing school concept.

> The culture of education decision-making of the present and future must certainly take into account that overall resources for education are limited and most probably diminishing in real terms. This situation is also probably now the norm and yet the needs of learners are ever changing and growing. Two new rules are required as the basis for education decision-making. The first rule can be stated as 'Make choices on the basis of the relative priorities of student learning needs'. The second can be stated as 'Shift resources in accordance with the changing pattern of learning priorities and within the limits of resources available (Spinks, 1988).

In this model, while some decisions are made centrally such as broad policy, curriculum and personnel matters (i.e. those affecting the whole school population), other decisions are made regionally or locally. Most of the decisions made on devolution relate to practical management while others relate to giving regions and schools flexibility to modify their programs to meet local needs.

In all cases, devolution of regional and local decision making has been required to take place within a policy and accountability framework determined by a central authority.

In the context of a clear central framework, devolution can assist in 'reducing the quality gap between urban and rural education' if we think of devolution not primarily as an administrative device or an economic necessity but as a process which can improve education and training outcomes at the local level.

Devolution can assist in improving outcomes for rural areas if the school or college develops partnerships with its associated rural community. Essential to this concept is the notion that the

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school, where it is the only school, college or educational institution in a rural area, can have its role expanded to that of a centre which provides access both for the delivery of existing services but also as a focus for all of the community's educational needs. In this way the school can become a real force in community development in rural areas.

In all countries, including Australia, there are minimum sizes for institutions. The larger the community the greater the range of services. Hence a community of a certain size gets a primary school. A community of larger size gets a high school and a primary school, a yet larger community will have several primary schools, one or two high schools and perhaps a technical college - and so on. Clearly the community which only has a primary school lacks direct local access to secondary and technical programs.

Institutions in small remote areas can be transformed if they are redesignated as community education centres providing not just primary education but access to secondary and technical education by correspondence and local tutoring.

If this access can be enhanced by one-way video or one-way radio lessons, plus interaction with remote tutors by phone or two-way radio - there is an immediate enhancement of the quality of education offered. If the students or adult learners can learn at their own pace, working through study modules and using a community education centre as the access point, then an open access centre with greater potential to support local economic development is created. By involving the community in the governance of such a community education centre, the centre may be able to expand its courses to provide skills training required for local farming and business activities. With the voluntary support of local industry and the community, the centre can become an active agent for growth and development.

In other words, a school or college can become a dynamic rather than a passive service to the community.

4.2 *Case studies in delivering formal and non-formal programs in Australia*

Several case studies are presented in outline below. They range from a small remote community with a population of less than 100 people to services provided to remote areas in a State with 4 million people.

4.2.1 Case Study of the Community Education Centre (CEC) Concept at Maningrida (NT)

The community of Maningrida was the first non-church settlement developed in the Arnhem Land region of the Northern Territory. It was founded in the mid-50s in an attempt to reduce the exodus of Aboriginal people from Arnhem Land to Darwin in the wake of the cultural exposure provided by World War II.

Maningrida is located 450 kilometres to the east of Darwin, on the east bank of the mouth of the Liverpool River. The Maningrida community is 400 kilometres from the nearest town of any size, Darwin. It has no road access for 7 months of the year and then only by 4 wheel drive vehicle. It has sea and air access for 12 months of the year.

For many years the community in its idyllic setting in tropical savannah bushland was a Federal Government showplace in which many projects were trialled and in which up to 30% of the population was not Aboriginal.

Today, the community is home and/or service centre to approximately 2000 people of whom the overwhelming majority is Aboriginal. The local traditional landowners have reluctantly permitted development on their land and now, although they are a small group, their language, Djebanna, is one of the two indigenous languages used in the bilingual program in the CEC.

The development of Community Education Centres in the Northern Territory of Australia is the result of careful consideration of the needs of remote communities - small mining towns, small highway settlements serving passing tourist trade and very remote communities serving traditionally oriented Aboriginal people. The concept is founded on the basic right of Aboriginal people to have equality of educational opportunity within the context of their cultural heritage in accordance with article of the World Declaration on Education for All.

A Community Education Centre provides for the effective co-ordination of all educational resources available to a community. It offers as comprehensive a range as possible of educational programs and services comprising pre-school, primary, secondary and adult education. It also has the capacity to respond positively to the educational needs, expectations and aspirations of its individual community.

Community Education Centres like Maningrida directly facilitate the growing desire of Aboriginal people, who live in a traditional setting, for self-determination and self-management.

Maningrida is one of 14 Community Education Centres in the Northern Territory. In remote areas the development of appropriate curricula with direct input from local communities has been a major educational initiative in the Northern Territory. The utilisation of centrally accredited courses is mandatory to achieve the goals of equity of participation and parity of qualifications for remote learners with learners elsewhere in Australia. But locally developed courses, also centrally accredited, allow Community Education Centres to offer the most suitable range of courses for its clients to enable them to participate fully in the social and economic development of the communities.

Maningrida CECs has collectively, 54 NT Teaching Service and Public Service staff, 11 Remote Area Teacher Education students and staff, and several other employees including those who are engaged in work contracted by the Community Education Council. In its operations the CEC encompasses a hub school and ten small outstation schools within a radius of 200 kilometres. The CEC offers early childhood, primary, secondary correspondence,

outstation, bilingual and teacher education programs. In addition, the Adult Educator services community initiated programs involving secondary-aged and adult students. Examples of these are:

- the contracting for maintenance tasks in the community by young men;
- painting of buildings;
- some building construction - concrete slab and shed erection.

Such projects are in addition to involvement in more formal course delivery.

Maningrida CEC represents the effective combination of expertise available in school and TAFE staff members and community participants.

4.2.2 Barkly TAFE Centre (NTOC), Tennant Creek

The Northern Territory Open College is a distance education institute which aims to provide access to education and training through a variety of instructional activities determined by the location and needs of the learner.

Katherine and Barkly are two Regional Centres of NTOC. They offer two diverse approaches - one in a rural township (Katherine) and one in a sparsely populated area (Tennant Creek).

The Barkly TAFE Centre at Tennant Creek provides further education services to a population of 7 000 people scattered over an arid region of 24 600 square kilometres. Within the region there are many small and medium size mining operations, the latter being highly mechanised. There are also many large pastoral properties (beef and cattle). The remaining towns fall into three groups:

- small service centres;
- highway towns serving passing tourists, service delivery traffic and heavy transport and small and remote Aboriginal communities, some living a traditional life style, others commencing commercial enterprises (mainly cattle raising);
- Tennant Creek, the only town of any size which provides central services.

The College is located in the major centre, Tennant Creek (population 3000). Field staff are located in four smaller centres within this region; teaching, monitoring and co-ordinating a number of programs, providing support for trainees of Government departments and colleges as well as providing a liaison with itinerant programs developed by the Northern Territory Open College in its provision of on-site training in remote communities.

In 1992 the Barkly Open College is relocating to new premises within Tennant Creek and expanding its services to include a creche (the only one in Tennant Creek), an enhanced program for single parent families and a program for remote Aboriginal women. A newly

purchased trucking shed, renovated by students of a trade based pre-employment training program will cater for a number of men who have travelled from remote communities to undertake full time training in trade based courses that will provide the essential skills required to service the infra-structure of their communities.

Another covered area within the new location will be similarly renovated to provide a purpose built hall that will become home to an Aboriginal women's program servicing the development of cottage industries in the region and developing strategies to teach the essential skills of numeracy and literacy.

In smaller communities, the thrust of this expansion has been to develop a network of workshops and facilities to be used for local training. Communities have identified priority areas of learning that also include the vocational and trade based courses necessary for maintenance of public standards. Experience has shown that these skills are best learned in the environment of their own community.

The success of the Northern Territory Open College in the rural areas, has been its ability to tailor programmes that directly address the specific needs of the individual client through close community consultation and the involvement of the community in the governance of the College centrally and at each College centre such as the Barkly Centre.

Remote Aboriginal communities are now developing long-term community plans that incorporate the Northern Territory Open College as their preferred training provider. At a higher level, certificate courses developed by the TAFE system in the NT are being accepted as models for a standardised National Curriculum for remote communities. Good examples are the Certificate in Community Store Work and the Advanced Certificate in Community Store Supervision. These practically based courses are conducted on-site, are competency based and are designed to train people in remote communities in the management of real stores.

In response to the call for training providers to promote on-site programs for remote communities the Northern Territory Open College has developed a number of itinerant courses including Mobile Welding, Mobile Mechanics and Mobile Bookkeeping. These courses attend to the essential needs of communities. For those communities who are predominantly traditional Aboriginal people trying to adapt to a westernised society, the itinerant courses have been an outstanding success in terms of attendance and desired community outcomes for local self management and self maintenance. Administration of other training courses in the regional centre involves a careful monitoring process aligned with an appropriate curriculum and prudent selection of the student body that allows for a better management of desired performance outcome indicators from these courses.

Another initiative by the college to liaise with a client group is a Search Conference into Employment and Training for Aboriginal people in the Barkly region. Scheduled over a week in October, this conference will target strategies by which Aboriginal people can raise their employment profile in the area. The conference will seek directions from Aboriginal leaders and will later present these to a forum of local business leaders to establish a common ground

of need and identifying mechanisms by which resident Aboriginal people can be deployed into a workforce that depends so much on an itinerant population for its stability.

4.2.3 Northern Territory Open College (NTOC), Katherine

The Katherine Regional Centre of NTOC services an area approximately 1000 kilometres wide and 400 kilometres deep. It has four permanent centres and an itinerant service extending to the northern part of Western Australia, where there is considerable consultation and co-operation.

NTOC at Katherine has developed close links with the local community and other education providers in Katherine, establishing itself as a vital element in this small community (population 7 500).

A staff member of NTOC is stationed within the offices of the Commonwealth Department of Employment, Education and Training (DEET) in Katherine to provide close and detailed communication with DEET field officers. This has enabled NTOC Katherine to respond to labour market needs as they are articulated by the Commonwealth Employment Service (CES), and to develop programs which fit local needs.

When taking the Australian Training Scheme Certificate Course in Hospitality, NTOC Katherine students are taught in local hotel and motel venues, even for off-the-job components of the course. Local industry/business welcomes the opportunity to provide NTOC student with this 'real-life' training.

Close links have been established with the local high school providing counselling and career advice to intending school leavers. Some subjects studied in Katherine High School have been given credit points for vocational programs at NTOC. A school/College program is being developed which will see appropriate high school students attending NTOC for one/two days per week to study in specific vocational areas.

4.2.4 The Tanami Network

This project is remarkable because it has been initiated from a group of communities, rather than by central authorities. Its historical background is given below.

The Tanami Network represents the latest development in an evolutionary process. Such developments have been geared to a series of community sponsored workshops and demonstrations in which ideas and technologies are explored. The basic themes of these is always the same. That is, 'how can people be brought together more effectively' and 'how can remote Aboriginal communities become involved in media and communications as an act of self-determination'.

The significance of the Tanami Network is that it provides a powerful way in which the communities can act together across a whole range of existing activities. Many of these activities at present cannot be attempted in a strong or coherent way, whether in the area of domestic or traditional life or the delivery of services.

The Tanami Network community thus builds on earlier work done on broadcasting and telephone links - in many ways it presents the pinnacle development of a process which has been going on for 8 years.

Its implementation will be pursued with the same perseverance by the people in the Tanami Communities as have earlier stages of development.

The present project involves the linking of four remote communities - Lajamanu, Willowra, Yuendumu and Kintore, as well as Darwin and Alice Springs with video conferencing facilities.

4.2.5 Victorian Example

The following is an excerpt from the D'Cruz Report (D'Cruz 1990) which studied policy and practice in delivery for both non formal and formal education in Victorian schools. A further project, the Ministry Telematics Support Network is about people from all areas of education and training - primary, secondary, vocational, industrial and tertiary - linking together for the purposes of promoting learning through Telematics resource sharing.

Assumptions of the Project

- cross-sectoral co-operation is desirable and essential;
- information technology and communications technology have a positive and productive role to play in education and training;
- information technology and communications technology and sharing of resources can assist in broadening the choice of students;
- the successful application of information technology and communications technology in education is dependent on human input and management, and
- the recommendations contained in this document will be considered in Ministry policy and planning and will be implemented in both theory and practice.

Summary of Findings

The Telematics Network Support Team has investigated telematics networks at various stages of their development. Across the State, the investigation has revealed a number of issues and needs which require addressing for the future and successful development of telematics in all Sectors of the Ministry of Education and Training.

1. Professional development for practitioners of telematics is crucial at all stages of the development of a network. A range of strategies including general awareness programs,

hands-on skills development, curriculum development and operational considerations are required. It is important that Professional Development be available to those with management responsibilities related to telematics as well as to those actually using telematics for curriculum delivery.

2. The integration of telematics as a strategy, planned and budgeted for as part of an organisation's total operation, is a significant step in the development of networks. The planned integration of telematics includes addressing issues such as timetabling, time allotments and allowances for teachers, initial capital outlays, recurrent costs and the sharing of resources.

3. There are a number of vibrant and dynamic telematics networks operating successfully throughout Victoria. Their further development can best be enhanced by the adoption of a strategic planning approach at the State, regional and local levels. Such an approach also facilitates the development of telematics networks in areas not currently served.

4. The provision of a system-wide policy framework for the development of local procedures and policies will facilitate expansion and improvement of telematics delivery, whilst encouraging responsiveness to local needs.

5. The development of networks within sectors of the Ministry of Education and Training, with associated resource sharing and cooperation, is extensive. The history of resource provision has encouraged more development in some sectors, but there is active interest in telematics throughout the Ministry. The challenge for 1991 and beyond lies in further development of cross-sectoral networks which allow more effective utilisation of resources.

6. The use of telematics and its associated technology is dynamic. New and upgraded technologies appear regularly in the marketplace; new and innovative ways of applying them, especially in education, are constantly evolving. It is therefore possible to identify an on-going and dynamic cycle of development that sees telematics practitioners and networks progressing through a series of stages:

   - from early experimentation and testing
   - through implementation and development
   - to refinement, innovation and promotion.

Because of the dynamic nature of this development, the constant emergence of newer and more accessible technologies and the variation in local needs and circumstances, all telematics networks appear to progress through this cycle. Importantly, any one network may operate at all three of these stages concurrently. As a consequence new telematics networks have an opportunity to observe, evaluate and build on the experience of the 'pioneering networks' preceding them. Any development of strategies and policy related to telematics, especially at the system level, will likewise benefit from a recognition of these processes.

An Overview of the Sectors

Curriculum delivery in schools through Telematics has been an evolutionary process, starting in late 1986 with the implementation of the Victorian and Commonwealth governments' Resources Agreement Number 3. The Telematics Operations Unit, part of the School Programs Division, oversees the implementation and management of telematics on a statewide level.

Telematics have been used to assist in broadening the curriculum available to students, especially in rural locations. Groups of schools have formed clusters to share the available teaching resources.

Teachers using Telematics operate in an 'extended classroom' environment instructing students in a remote school and in their own school simultaneously. Class sizes are kept small to allow for maximum interaction. Up to three different links using varying forms of technology, may be used to bring the students and teacher in contact with each other.

Schools themselves have been directly involved in a great deal of the developmental work towards the creation of a system that meets the very specific needs of the extended classroom concept and now almost all areas of the curriculum are being taught via telematics in various locations across the State.

There is no suggestion that Telematic curriculum delivery is as good as face-to-face teaching. However, students in remote locations have a greater curriculum choice without the need for studies by correspondence, or to move away from home.

Several very useful side effects have surfaced for students studying in this manner:

- greater awareness and skill of the technologies involved;
- greater responsibility assumed for one's education, and
- the chance it provides for teachers to review the curriculum they are teaching along with appropriate modes of delivery.

The extent to which the use of telematics-based curriculum delivery has progressed is a reflection of a number of interrelated factors and influences including the financial contribution of the Commonwealth Government and the initial placement of equipment in schools with a prior history of resource sharing and cooperation based on their clustering, often under the Country Education Project.

Within the State Training System, TAFE Colleges have been trialling, using and evaluating a variety of telematics technologies. Optel, Mac/Fax/DUCT, Vistel, ISDN, the satellite and audio conferencing are just some of the telematics technologies being investigated. And in 1991 the Office of the State Training Board will establish a Centre for Flexible Learning to provide system-wide coordination of Open and Flexible learning in the TAFE Sector.

Telematics are being used regularly in the TAFE sector, with major emphasis on audio links using handsfree telephones or audioconferencing units such as the DUCT unit. Some of the Colleges have installed their own audioconferencing Bridges so it is not uncommon for curriculum delivery to take place through multipoint links. Other Colleges have used Telecom's Teleconference service to the same end.

Footscray College of TAFE has made a major investment in and commitment to Olivetti's OPTEL system. Three-way multipoint links have been established on a trial basis but the system appears to have been slow in gaining general acceptance amongst other TAFE colleges. Outer Eastern College of TAFE has also made a sizable commitment to OPTEL.

Some Colleges have Satellite facilities which have enabled them to receive programs from various venues such as Sunraysia College of TAFE, The Gordon Institute and from interstate sources as well.

Vistel has also been used by several TAFE colleges, primarily for administrative purposes such as college council meetings with the State Training Board.

There is a strong interest in the use of Telematics across the TAFE sector. A strong desire to coordinate the various colleges' approaches is becoming apparent so that more productive and positive use can be made of data and video links in the delivery of TAFE courses.

Some TAFE teachers have expressed the need for more guidance at the system level about future directions for telematics delivery. Increased funding and support for experimentation with the various available systems and for more extensive and intensive professional development is regarded as having a high priority.

The Division of Further Education has recognised the important role Telematics can play in the delivery of further education, especially in the non-metropolitan regions.

To date the Division has concentrated on hands-free (loudspeaking) telephones for use in the programs it offers. Telematics practitioners have utilised audio and, when possible, the document (facsimile) links to provide:

- tutor-training programs usually on a 1 to 1 basis, for volunteer Adult Literacy and Basic Education tutors;
- to establish a support group for tutors of intellectually disabled students, and
- in course delivery, including the provision of Adult Literacy and Basic Education programs for the Office of Corrections.

The Division of Further Education and its providers have a well established reliance on support from other sectors of the Ministry of Education and Training. The majority of the programs for which they have responsibility are clearly cross-sectoral. Staff have recognised some of the practical and procedural problems which arise from such an approach.

There is a growing awareness among the Division of Further Education that telematics has the potential to broaden the Division's client group, develop the curriculum they offer and generally improve access to their services. There is clear potential for people in even the most remote and isolated areas of the State to receive further education using telematics. However, there is a need for practical demonstration and utilisation of the technology - professional development - to be implemented is this is to take place.

4.2.6 Queensland Example

Queensland has a relatively dispersed population through the entire state. TeleLearning and the use of technology in delivery of Education has been regarded as a priority area of research since the early 1980's. Experiments and trials were conducted using AUSSAT, a communications satellite, and with other means of transmission and message receipt.

Its main summary points are:

- Teacher attitude and the level of administrative support are the key factors contributing to success, not a teacher's prior experience or the sophistication of the technology employed;
- Increasing the complexity and number of the devices attached to the system is likely to increase teacher management overheads but not necessarily increase the level of meaningful interactions between students and teacher;
- The nature of the environment in which TeleLearning students must operate influences the number of students that can participate, the reliable functioning and maintenance of equipment, and the type of subjects that can be taught;
- Supervision requirements decrease with older students but there is a distinct need for an adult at the receiving school to assume a pastoral role at all levels;
- Full-duplex phone systems are the most appropriate for high levels of two-way student interaction but the type of equipment required will vary in complexity with the size and age of the student groups;
- The successful implementation and the long-term cost-effective utilisation of TeleLearning will be a product of long-term regional planning and management rather than the future development of communications equipment;
- There is a real danger that schools will see the TeleLearning equipment as belonging to them rather than as a regional resource to be moved to appropriate locations. If the process becomes 'institutionalised' in one school because of poor planning and administrative apathy, the cost-effectiveness and value of the concept will be lost;

- As well as this particular case, Queensland is committed to providing services in the following areas

  - Technology related courses,
  - Electronic Hearing Centres which involve the use of computers and other technologies in both classrooms and resource areas such as libraries,
  - Telelearning - communication technologies connecting students, and
  - Distance Learning System - loan of computer equipment to students in Distance Education, coupled with specialised learning packages tailored for distance education.

This trial has highlighted both the opportunities and difficulties common to all technology delivery of programs, including non-formal and ad hoc training or education.

4.2.7 National Remote Areas Project

The full provision of access to education in the most remote areas of Australia has always proved to be a complex and difficult task.

Aboriginal people make up the majority of Australians residing in the most remote areas. Yet historically distance education programs have not been designed around their needs and requirements, and delivery strategies have frequently overlooked remote Aboriginal communities. Unacceptably high numbers of Aboriginal students are not participating in education. A large part of this non-participation is due to limitations in access of remote area Aboriginal students to basic primary and, most particularly, to secondary education.

The establishment of a working party by the Australian Education Council (AEC) has recently led to a collaborative development of a project to provide distance education delivery of junior secondary education. The Northern Territory, in close co-operation with South Australia, Queensland and Western Australia has undertaken the task of providing secondary education appropriate to the local setting of remote Aboriginal communities. This principle is particularly important for Aboriginal students in remote areas because removal from the home community to undertake schooling may entail more than family disruption. It can involve dislocation from the cultural setting of the student's heritage.

The major challenge for this AEC project is the provision of access to full secondary schooling for remote communities and to strike a workable balance between the way schooling is normally provided on a full-time basis in order to complete courses and the cultural obligations placed on secondary-aged Aboriginal students. The answer lies in the development of learning packages that adopt a modular approach, allow self-paced learning, are flexible in sustaining open entry/open exit, flexible timetabling and flexible school year in remote communities.

4.3 Regional examples of school/community partnerships

Indonesia

Closing the quality gap between rural and urban education is a constant item on the agenda for countries like Australia with widely scattered small communities within a vast arid land area. It is also a key area of concern for most SEAMEO regional member countries who have large numbers of islands, mountainous areas, low lying infertile coastal areas and arid landscapes. In Indonesia for example, the following target groups were identified where small schools have difficulty functioning well:

- nomadic groups;
- boat people known as 'Orang laut' who live on boats all over the archipelago e.g. on the east coast of Sumatra and along the Flores and Sambawa Islands;
- Children of small communities in densely populated areas;
- the handicapped, and
- children of low economic status in big cities.

Other countries in the South East Asian regions similarly identified target groups. Some of the solutions being proposed now in Australia are regarded as innovative within our current national context.

Many of these so called innovative solutions are of course not new at all in the South East Asian context. A high level of local community involvement, the pairing of industries with schools, the establishment of and the installation of 'real world' production units in schools and the installation of modular instructional systems have been trialled and developed for 10 to 15 years.

Set out below is a brief summary of Indonesian experiences in developing small rural schools drawn from two papers presented by the Indonesian Department of Education* at the recent UNESCO sponsored South East Asia and Pacific Regional Conference on 'Education for All' in October 1990.
In the target groups listed above, the reality is that the diversity exists in the socio-cultural as well as the natural environment. Centralised curriculum is considered as one way of facilitating integration of a nation through education because it helps use communication as well as facilitates mobility in communities from one place to another. On the other hand it is not necessarily the only solution to the problems of educating the target groups mentioned above.

In order to meet the needs of the target groups for the education of children in remote rural areas, the small school pilot project was launched in 1978 in a number of villages in central Kalamantan. After 15 years of development and experimentation however, more than 20 000 small primary schools were involved in the program. The small schools concerned had a

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* Notes:

Prof Dr Mogleadi , *Equity and Education - Indonesian Experience* , Paper for Education For All Conference - October 1990 Darwin, Australia.

Dr Benny Suprapto Brotosiswojr, *School/Work Interface and Continuing Education for People in Remote Areas* , Paper for Education For All Conference - October 1990 Darwin, Australia.

number of innovative features:

- Pupils learned through modular instructional systems through the upper primary grades in addition to face to face contact between pupils and a tutor. Hence there is a long experience of using a modified approach to self-paced instructional material now being advocated in Australia through Open Access Learning Centres;
- Alternative methods of staffing were used in the small schools in addition to teachers, tutors, peer tutors and senior tutors were used;
- Skilled instructors were also recruited to teach areas of local relevance. eg. local skills development subjects;
- Innovative methods of involving the community in support of the school and bringing the school into communities were used. For example, "learning kiosk" in the school yard where pupils can study and conduct small group discussions. Learning places known as 'Patjar' where pupils could be supervised by home tutors and peer tutors were built by local communities, and
- Local government support was enlisted to motivate the members of communities to send their children to school.

Contrary to what might be expected, the skills required of teachers in the small schools situations exposed the teachers to greater challenges than those experienced by the normal classroom teacher in a large school. Teachers in this program among other things were required to be able to prepare and develop a new self-instructional material for the senior grades. They had to develop skills in diagnosing learning difficulties and helping each individual pupil to progress at their own individual pace. Teachers had to develop complementary skills to continuously evaluate and monitor the individual progress of each pupil as one would expect. School and classroom management for multigrade organisations were also required and as indicated above teachers needed to develop the skills to mobilise, organise and utilise community resources in a way in which most teachers in larger schools would not normally do.

One of the strategies advocated now in Australia to make open access learning work for schools, technical education and higher education is the use of modular learning materials. The Indonesian experience in the use of modules showed that some projects ended up with rather unsuccessful outcomes through using self-instructional material. Many reasons are given for this such as:

- the quality of materials including the level of language used;
- the overall management of the program such as the distribution of materials and modules to each individual pupil and teacher;
- the availability of complete sets of materials in each schools, and
- readiness on the part of the pupils, teachers and other educational personnel to use the materials.

A key outcome of the evaluation of this experience was that it seemed inappropriate to use nationally standardised modules for all pupils in remote areas of the country irrespective of the cost effectiveness of the program. A lesson for this in Australia is that in organising instructional

design and technological support for individual learners we should note of the Indonesian experience. In particular we should take note that these programs will not work unless the teacher, lecturer or organiser of the program is very skillful in classroom management either within a classroom situation or in the extended classroom situation using distance education techniques.

To put it another way, we are not yet at the stage where individual learning and self paced instruction is independent of the teacher except for a very small and highly motivated and organised section of the student body. For most students, modularisation and open access must still mean regular contact with a teacher or supervisor either in the classroom or tutorial situation. The recent Australian experience and the potential of the new technology is that the range of delivery will be vastly increased that the teacher of the future may be 1 000 kilometres away from the students of tomorrow. It is possible that they may never meet face to face. Instead they will communicate through a number of modes, print, facsimile, one way video, radio, telephone and computer-to-computer. Face to face contact when required may not be through the distant teacher who may have 10 000 students in his/her class. It may be through a locally employed tutor dealing with 12 to 30 students in a local area. Twenty years ago and perhaps even ten years ago, such notions were futuristic. In some countries now, they are reality and they are working. By the year 2 000 their use will be common place.

To take full advantage of these possibilities will require careful planning and close attention to instructional design and modularisation so that programs can be modified with changes in technology and changes in content from year to year.

The day of the long developmental project to produce 'perfect materials' is probably past. The speed of communication, the degree of technological change and the emerging community needs will force on us all changes in our teaching and learning methodology. All of these changes are positive for improving the quality gap between urban and rural education.

Solomon Islands

An example from the Pacific region can be found in the work of the Solomon Island Development Trust (SIDT) which, in 1982 began its village outreach program to touch rural people's lives in a sustained and penetrating manner. From the very beginning it prepared teams of villagers to become the sharers, teachers and consciousness raisers of other village people. These Mobile Teams were not city cousins bringing the education good word but were themselves villagers living and working among other villagers.

Over the past eight years the mobile teams have conducted more than 3,000 workshops using a number of group-analysis tools like the Development Wheel, the Village Quality of Life Index, Past/Now/Future and Village Economic Resource exercises to draw out villager information and understanding. The facts provided by villagers through the use of the above mentioned exercises became the raw material of the village-level workshop.

Population education, resource management and well being at the village level is SIDT's latest outreach pattern for 1990 through 1992. Over the past years it has focused on different aspects of village living. The first three year period it concentrated on water supplies and sanitation. The second three year plan (1987-1989), Disaster Awareness and Preparation, was a response to the devastating cyclone which struck the islands in 1986. Its current education outreach programs have been tied to the needs and desires of villagers.

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